Conclusion: We evaluated the outcomes of ARCR with tension less than 30 N. Postoperative JOA score, flexion ROM, and muscle strengths improved significantly after ARCR. Failures after ARCR were found in 4 cases, and the failure rate was 5.12 %. The FD in the failed group was significantly higher than those in the healed group. Although ARCR with less tension was effective for RCTs, we must pay closer attention in the cases with higher FD even if the retracted tendon can be mobilized with less tension.
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B0062

Outcomes after implantation of polyurethane meniscal scaffold for medial or lateral meniscal deficiency

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Background: Segmental loss of meniscal tissue is a risk factor for the development of osteoarthritis. Meniscal regeneration with biological scaffolding is a potential solution for this problem. The purpose of this study was to assess the clinical and magnetic resonance imaging (MRI) results up to 3 years after implantation of a polyurethane scaffold for chronic segmental medial or lateral meniscus deficiency following partial meniscectomy.
Material and Method: Six patients were treated with arthroscopic implantation of an ActiFit - (Orteq Sports Medicine) polyurethane meniscal scaffold for meniscal deficiency. Three of these were medial meniscal deficiency and three were lateral meniscal deficiency. Patients were followed up at 6, 12, 24 and 36 months. Clinical outcome was assessed using outcome scores (KOOS, KSS). Radiological outcome was assessed using MRI at 6, 12, and 24 months by evaluating scaffold morphology, scaffold integration, and status of articular cratilage, as well as evidence of inflammatory reaction.
Results: Six patients with a mean age of 29.5 years (range 27- 33) were enrolled. Improvements were present in all patients. MRI showed different signal intensity of the scaffold when compared to residual meniscal tissue.
No evidence of synovitis or joint inflammation. Extrusion of the scaffold was present in one patient. No correlation between scaffold extrusion and clinical outcome was observed. Two patients showed good healing of the microfracture osteochondroplasty for the focal grade III-IV articular cartilage defect directly over the scaffold.
Conclusion: Arthroscopic implantation of polyurethane meniscal scaffold in patients with chronic segmental meniscal deficiency is a safe procedure. It has produced good clinical results at 6 months to 3 years follow-up.
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B0063

Cartilage storage at 4°C with regular culture medium replacement benefits chondrocyte viability of osteochondral grafts *in vitro*

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Background: Transplantation using fresh osteochondral grafts is a routine clinical treatment approach resulting in excellent chondrocyte viability and good clinical results. Research has been conducted to establish novel methods to maintain the viability of cartilage grafts for as long as possible *in vitro*. However, short storage times with reduced cell viability of osteochondral grafts remains an issue in clinical transplantation.
Purpose: To determine the influence of storage temperature (4°C versus 37°C) and culture medium replacement on the chondrocyte viability of osteochondral allografts *in vitro* to identify desirable technical parameters for cartilage tissue banking.
Methods: Cylindrical osteochondral grafts (n = 120) were harvested from the talar joint surface of 10 Boer goats under sterile conditions and immersed in culture medium in sterile containers. Grafts were randomly assorted into four groups and stored in the following conditions: Group A1, 4°C with culture medium replacement every 2 days; Group A2, 4°C without medium replacement; Group B1, 37°C with medium replacement every 2 days; and Group B2, 37°C without medium replacement. Chondrocyte viability in the grafts was determined by ethidium bromide (EB)/fluorecein diacetate (FDA) staining at different time points (7, 21 and 35 days). Proteoglycan content of the grafts was measured by Safranin-O staining.
Results: Group A1 resulted in the highest chondrocyte survival rate at 90.88% (day 7), 88.31 (day 21) and 78.69% (day 35). For all time points except day 7, temperature, medium replacement, and the combination of both clearly affected chondrocyte survival. The integrated optical density (IOD) for Safranin-O staining decreased significantly with time in all groups. There were no significant differences in IOD values between groups on days 21 and 35.
Discussion: Since the beginning of the 21st century, researchers have deduced a set of crude tissue culture preservation methods for articular cartilage *in vitro*, which are used prior to the clinical transplantation of articular cartilage into defects. Although previous studies have focused on the influence of different storage temperatures on preservation, they have not focused on the interaction of temperature and medium changes. In our study, with the same frequency of medium replacement, storage of explants at 4°C was clearly better than at 37°C. Fluorescent staining showed that grafts preserved at 4°C with medium replacement every 2 days (Group A1) benefited with respect to chondrocyte viability compared with the other groups. We believe there are clear reasons for this finding. The Safranin O staining IOD value indicates the PG production level within the articular cartilage matrix. We found that temperature and the interaction between temperature and culture medium replacement did not affect the IOD value of the cartilage matrix at days 21 and 35. The EB/FDA dual fluorescent staining method used in our study is simple, intuitive and accurate, and has been used in a variety of animal and plant cell activity and microbiology tests. We verified good conformability in the viability testing in both EB/FDA immunofluorescence staining of the digest the cartilage cells and ED/FDA immunofluorescence staining of the cartilage cells in slices, with both methods complimenting each other. Some limitations exist in this study. First, we used cartilage samples taken from goats rather than humans. Second, our study did not take into account pH values experienced in storage.
Conclusions: Chondrocyte viability was maintained to a greater extent when osteochondral explants were stored at 4°C with regular culture medium replacement.
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B0082

Inferior balance strategy is associated with insufficient training experience but not with injury history in rugby players

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Background: Balance strategy and balance performance of rugby players with a history of injury are important yet under-examined issues. This study aimed (1) to examine the differences in balance strategy and balance performance between amateur rugby players and non-players, and (2) to explore injury- and training-related factors that may affect rugby players' balance outcomes.
Material and Method: This is a cross-sectional and exploratory study. Forty-five amateur rugby players and 41 healthy active individuals participated in the study voluntarily. Both balance performance and balance strategies were assessed using the sensory organization test (SOT) of the Smart Equitest computerized dynamic posturography machine. Rugby training history and injury history were obtained by interviewing the participants.
Results: Multivariate analysis results revealed that the SOT strategy scores were 1.99–54.90% lower in the rugby group than in the control group ($p < 0.05$), and the SOT condition-specific equilibrium scores were 1.06–14.29% lower in the rugby group than in the control group ($p < 0.05$). After accounting for the effects of age, sex and body mass index, only length of rugby training was independently associated with the SOT condition 6 strategy score, explaining 15.7% of its variance ($p = 0.006$). In addition, there was no association between SOT condition 6 strategy/equilibrium scores and history of injury among the rugby players ($p > 0.05$).
Discussion: The suboptimal postural control strategies (over-reliance on hip balance strategies) observed in the rugby players might be associated with the specific movement patterns used during rugby matches (e.g., tackles and collisions). However, with increasing training experience, rugby players gradually shifted their balance strategy from a predominantly hip strategy to an ankle strategy. History of injury including lower limb musculoskeletal injuries and mild concussion was not associated with inferior balance strategy or performance among the rugby players. This finding may be attributed to recall bias or spontaneous recovery. Nevertheless, our results may be relevant to the development of rugby-specific injury prevention programs, including balance enhancement training for the less experienced rugby players, to ensure that all players participate in rugby matches safely.
Conclusion: The amateur rugby players with a history of injury predominantly relied on a hip, rather than ankle, strategy to maintain standing balance and demonstrated suboptimal balance performance compared to their non-training counterparts. Interestingly, their suboptimal balance strategy was associated with insufficient training experience but not with history of injury.
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B0085

Which position of femoral tunnel is better in single bundle PCL reconstruction? Higher vs lower in 3D-CT

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Background: The purpose of this study was to compare the clinicoradiological results according to femoral tunnel position using three-dimensional computed tomography (3D-CT) in arthroscopic single-bundle PCL reconstruction.
Materials and Methods: Eighteen knees that underwent primary arthroscopic single-bundle PCL reconstruction between October 2010 and September2014 for an isolated PCL rupture were retrospectively evaluated with a minimum 1–2 year follow-up. The patients were divided into higher (n = 10) and lower (n = 8) femoral tunnel position groups. The quadrant method was used with postoperative 3D-CT to verify femoral tunnel position. Range of motion (ROM), International Knee Documentation Committee (IKDC) score, Lysholm knee score, and the Tegner activity score were compared between the two groups as a clinical evaluation. Preoperative and postoperative stress radiographs using the Telos stress device were used to assess anteroposterior instability.
Results: No differences were found in ROM, IKDC score, Lysholm knee score, or Tegner activity score between the two groups at the last follow-up. No differences were found in the posterior